Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of:	)	
Amending the Definition of Interconnected VoIP Service in Section 9.3 of the Commission's Rules	)	GN Docket No. 11-117
Wireless E911 Location Accuracy Requirements	)	PS Docket No. 07-114
E911 Requirements for IP-Enabled Service Providers	)	WC Docket No. 05-196

COMMENTS OF MOTOROLA MOBILITY, INC.

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Motorola Mobility, Inc. ("Motorola Mobility") hereby submits the following comments in response to the Federal Communications Commission's ("Commission") Notice of Proposed Rulemaking, Third Report and Order, and Second Further Notice of Proposed Rulemaking ("*Notice*")[1] proposing various measures to improve 911 availability and location determination for users of interconnected Voice over Internet Protocol ("VoIP") services and others.

I. INTRODUCTION & SUMMARY.

The Commission has done much over the last year to support and strengthen the E911 program. In the 2010 *E911 Location Accuracy Second Report and Order*, the Commission strengthened the automatic location information ("ALI") obligation for commercial mobile radio service ("CMRS") providers and established a clear and aggressive transition schedule for the

[1] Amending the Definition of Interconnected VoIP Service in Section 9.3 of the Commission's Rules; Wireless E911 Location Accuracy Requirements; E911 Requirements for IP-Enabled Service Providers, GN Docket No. 11-117, PS Docket No. 07-114, WC Docket No. 05-196, *Notice of Proposed Rulemaking, Third Report and Order, and Second Further Notice of Proposed Rulemaking*, 26 FCC Rcd 10074 (2011) ("*Third Report and Order*" or "*Notice*").

new obligations.[2] The Commission builds upon these steps in the *Third Report and Order* by setting a sunset date for the current network-based accuracy standard and by stating that all future CMRS networks would be required to meet the location accuracy standard currently applied to carriers using a handset-based location accuracy technology, regardless of the actual technology implemented by the carrier.[3] Motorola Mobility supports this action and is already transitioning toward incorporating A-GPS functionality in the vast majority of its handsets. However, any new rules should preserve technical neutrality to allow service providers and manufacturers to continue developing other innovative solutions, such as hybrid location accuracy solutions employing handset-based technologies with a network-based component as a backup. Appropriately, the *Third Report and Order* does not prohibit such designs or prescribe any specific technologies as it moves toward a uniform location accuracy standard.

As for the proposals contained in the Notice of Proposed Rulemaking and Further Notice of Proposed Rulemaking, while Motorola Mobility shares the Commission's belief in the importance of making available a robust E911 system that keeps pace with changes in technology and usage patterns, it is important that the Commission not adopt premature regulations that stifle innovation by imposing obligations on nascent technologies and service providers before the industry and market are capable of fulfilling them. Standards development efforts are still in the earliest stages, and feasible, enforceable, realizable, solutions to challenges such as over-the-top VoIP applications, the diversity of different access network architectures, and outbound-only calling services are still being developed. Providing ALI for VoIP in reliable

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2 *See* Wireless E911 Location Accuracy Requirements, PS Docket No. 07-114, *Second Report and Order*, 25 FCC Rcd 18909 (2010) ("*E911 Location Accuracy Second Report and Order*").

3 *Third Report and Order*, 26 FCC Rcd at 10082-10084 ¶¶ 19-23.

fashion will require the cooperation of the VoIP application developer or VOIP service provider. As such, any new regulatory obligations should be imposed on this entity, and not on the device manufacturer or Internet access service provider. Similarly, the Commission should not adopt new obligations for service providers to conduct indoor location accuracy testing. While the Commission was correct to refer this issue to the Communications Security, Reliability, and Interoperability Council, upon receiving that body's recommendations, the Commission should consider alternative data collection models, including leveraging the ongoing technological improvements in public safety communications systems.

New broadband technologies like mobile VoIP and outbound-only calling services are still niche products undergoing rapid changes as they develop into the consumer marketplace. Significant technical and operational challenges remain in providing ALI for these services. At this stage of development, the Commission should focus on encouraging the growth of these technologies and the ALI standards that will support them while implementing the important E911 rule changes it has already recently adopted.

II. THERE REMAIN SIGNIFICANT CHALLENGES TO PROVIDING E911 FUNCTIONALITY ACROSS ALL INTERCONNECTED AND OUTBOUND-ONLY VOIP SERVICES.

As VoIP services continue to increase in variety and popularity, Motorola Mobility appreciates the Commission's desire to ensure that users of these services have the greatest access possible to life-saving emergency services. However, there are significant technical, structural, and policy challenges that stand in the way of applying all E911 obligations to interconnected VoIP services and outbound-only VoIP services. Because of the number of different parties and technologies involved, providing ALI over all such VoIP services will require broad and sustained collaboration between service providers, manufacturers, and application developers. Although development efforts have begun, user-provided location

information will continue to be the best or only available location information for many VoIP 911 calls for the foreseeable future.

Even with new standards and the availability of upgraded technology, there may be situations in which device manufacturers and Internet access service providers are unable together to guarantee the delivery of ALI for VoIP. For example, there are likely to be some legacy non-ALI capable VoIP equipment and software that remains in use; some holdout operators of Wi-Fi access points and other private or public networks that fail to take the necessary steps to provide ALI; and some application developers that fail to incorporate the necessary standards and functionality. As such, the Commission should not merely impose obligations on manufacturers and Internet access service providers related to the provision of ALI over interconnected and outbound-only VoIP and expect the industry to invest and innovate to meet them. Ultimately, providing ALI for VoIP will require the cooperation of VoIP application developer or service provider, and the Commission should craft its regulatory expectations accordingly.

Motorola Mobility notes that the wide variety of services and networks that can be involved in delivering interconnected VoIP services makes it unlikely that any meaningful uniform standard can be applied to all VoIP emergency calls any time soon. For example, the provision of automatic location information over interconnected VoIP services is substantially complicated by the proliferation of over-the-top VoIP applications, which raises a host of novel technical, practical, and policy challenges. Similarly, there are as many different varieties of VoIP implementations as there are VoIP applications and broadband networks—and each of these may require unique-standards based solutions for the provision of ALI. This will be a major undertaking involving many parties and, due to the existence of legacy hardware and

software, it is very difficult to predict when all interconnected and outbound-only VoIP services will be able to meet the Commission's unitary location accuracy standard applied to CMRS.

A. Over-the-Top and Outbound-Only VoIP Applications Challenge the Existing E911 Paradigm.

Because of the numerous parties and multiple technology platforms involved, over-the-top and outbound-only VoIP applications present special challenges for the provision of ALI, and new standards still need to be developed before ALI obligations for these services would be appropriate. As Motorola Mobility has previously explained, because of the manufacturer's and service provider's lack of control, the Commission should ensure that any new E911 obligations associated with over-the-top and outbound-only VoIP applications are assigned to the application developer. Moreover, the Commission should recognize that providing ALI for these VoIP applications will require the resolution of technical complications and competing public policies that extend beyond any one entity or sector.

Motorola Mobility reiterates the point made in its Comments and Reply Comments on the *Location Accuracy FNPRM and NOI*, that if the Commission decides that it is appropriate to impose ALI obligations on over-the-top VoIP applications, the fulfillment of these obligations should remain the sole responsibility of the application developer.[4] These points apply equally with respect to outbound-only calling VoIP services. Application distribution channels like the Android Market provide significant benefits for consumers; however many of these channels are inherently open environments wherein the device manufacturer has little or no control over the content and applications available to users. Under these circumstances, manufacturers and broadband service providers may not know what applications a user installs, and likely will not

[4] *See* Comments of Motorola Mobility, Inc. and Motorola Solutions, Inc., PS Docket No. 07-114, WC Docket No. 05-196 at 12 (filed Jan. 19, 2011); Reply Comments of Motorola Mobility, Inc., PS Docket No. 07-114, WC Docket No. 05-196 at 8-9 (filed Feb. 18, 2011).

be able to alter the operations of the application so as to ensure the effective delivery of ALI. Only the VoIP application developer has knowledge of the functional and technical details of the VoIP service, how it connects to and transmits over broadband networks, what devices it is designed to operate over, what standards it complies with, and other specifics necessary to the provision of ALI.

New applications are constantly being added to the online markets, and providers of these markets are not capable of evaluating each application to determine whether it constitutes a VoIP service and whether it provides accurate ALI. Moreover, many applications are delivered to consumers outside the major application markets, through third party online communities or directly by the developers. While many developers can be expected to take advantage of any standardized mechanism for providing ALI for emergency calls, some application developers will be unaware of the Commission's rules, will misinterpret their scope, or will simply disregard them. Because application developers may be outside of the Commission's regulatory jurisdiction, particularly when they are located outside the United States, placing an obligation on manufacturers or service providers could create a situation where the regulated party is incapable of bringing the service into compliance and instead must choose between accepting noncompliance or attempting to block access to a service in a way that would be unpopular with the user community and in tension with Internet and platform openness.

While the ultimate responsibility should rest with the VoIP application developer, providing ALI for over-the-top and outbound-only applications will require coordination between a number of entities to overcome various technical and policy challenges. For example, in addition to the involvement of the broadband network operator and the device manufacturer, providing ALI for over-the-top VoIP will also implicate the operating system developer. Some

current configurations of the Android operating system do not allow applications to override a user's location privacy settings. Thus, an over-the-top mobile VoIP application cannot be guaranteed access to ALI even during a 911 call. Here there is a direct tension between the public interest in providing accurate E911 location information and concerns about location privacy and the use of location information by application and operating system developers. Even if this policy tension is resolved in favor of allowing disclosure of location information during emergency calls notwithstanding a user's privacy preferences, new standards would need to be developed and implemented into future releases of both the operating system and the application in order to grant the VoIP application this limited access to user location information, and to protect the user against abuse of the override by malicious applications.

B. Each Access Network will Pose Different Challenges for Providing ALI for Interconnected VoIP.

Providing ALI for VoIP services will demand significant platform-specific and provider-specific solutions. While some general protocols are under development that will be useful in standardizing how the relevant information is encoded and shared between the various network layers, ultimately the challenges and appropriate solutions for providing ALI will depend largely on the specific network architecture of the broadband service provider and on the characteristics of the VoIP service. In many cases, providing ALI will require the addition of new network infrastructure components. If service providers are required to deploy new hardware and software outside of their normal system upgrade schedule, this could add substantial cost and complexity, and take significant time.

Even within a single industry, the ALI solution will likely vary from provider to provider—or even within one provider's network—depending upon the network design and the specific components present. To illustrate, a typical cable broadband/residential VoIP

implementation includes a multimedia terminal adapter ("MTA") at the customer premises to the subscriber's access to the Internet or VoIP service, a cable modem termination system ("CMTS") at the edge of the system operator's network to provide the interface to the Internet, and a system of physical connections, transfer protocols, and standards in between the two. However, variations at each level of this network will affect the ALI solution. MTAs can be embedded in the cable modem or separate tethered units. Moreover, they can be leased from the service provider or owned by the customer. Each of these units will, at a minimum, require software upgrades, and may require replacement. Different CMTSs will have different technical limitations and capabilities, and may themselves require software or hardware upgrades. The data conveyed to the CMTS will depend largely on the choice of protocols and quality of service ("QoS") specifications deployed by the system operator.

Significant work remains to be done on developing standards and solutions to support ALI across the variety of different implementations currently in the field. As the above overview of cable broadband networking demonstrates, achieving the provision of accurate ALI will require the coordination of a wide variety of entities including manufacturers of consumer devices and network infrastructure, system operators, VoIP service providers, and users themselves. Motorola Mobility suspects that the situation is similarly complex across other broadband Internet access platforms. First, specifications and protocols would need to be developed, followed by product design, testing, and deployment. While, at least the context of residential VoIP service provided by the cable system operator, the provision of ALI is likely possible, these processes are just getting under way. Considering the uncertain scope of the work, time, and cost that will be required, adopting new obligations would be premature at this time.

Similarly, there are currently no approved standards in place for the provision of ALI over Wi-Fi networks. Wi-Fi Internet access provides an additional layer of complication because the operator of the Wi-Fi access point will often be different from the operator of the Internet access service, and the underlying network operator may have reduced control and supervision of the services operating over Wi-Fi. Significant work remains to be done on the development and implementation of the standards and databases that will be necessary to collect and deliver ALI over Wi-Fi.

Even when Wi-Fi ALI standards are complete, these networks will likely provide less reliable location information than other forms of Internet access. Many consumer operators of Wi-Fi access points may never register the device or conduct the software or hardware upgrade necessary to provide ALI. Moreover, because Wi-Fi connections are easily shared, even surreptitiously, a VoIP call placed over Wi-Fi may actually originate from a different unit or building from the one registered to the devices. Add to the above the portability of many Wi-Fi access devices, and it is clear that ALI provided over a Wi-Fi connection is unlikely to ever reach the level of accuracy required of handset-based location technologies in the CMRS world. Especially as the Commission continues to move toward a unitary standard for E911 location accuracy, it is premature to apply ALI requirements to interconnected VoIP services operating over Wi-Fi connections.

III. THE COMMISSION SHOULD NOT REQUIRE INDOOR LOCATION ACCURACY TESTING BY SERVICE PROVIDERS.

The Commission was correct to refer consideration of indoor location accuracy testing mechanisms to the CSRIC,[5] and it should allow the CSRIC's findings to be developed and publicly examined before making any decisions on this issue. While more analysis will be

[5] *Notice*, 26 FCC Rcd at 10104 ¶ 88.

necessary to determine the best mechanisms for location accuracy testing in general, and indoor location accuracy testing specifically, Motorola Mobility believes that applying a new indoor testing requirement on service providers would be unduly burdensome and would fail to provide enough useful data to justify the expense and hardship. However, because this data will be important to improving the effectiveness of the overall 911 system, the Commission should consider alternative means of measuring indoor location accuracy.

One alternative the Commission should consider is collection of location accuracy information by first responders during real-life response situations. As the Commission recognized in the *Notice*, collection of indoor location accuracy information is extremely problematic for service providers.[6] However, public safety responders are already on the scene of an emergency, and they represent the only source for truly relevant data on the accuracy of E911 location information.

Public safety responders can likely leverage ongoing developments in communications technology to take real-time location accuracy measurements without any impact on the performance of their duties. This data collection would be facilitated by the ongoing deployment of public safety mobile broadband networks and the increasingly common integration of GPS technology in public safety radios.[7] Based upon recent technological advances, Motorola Mobility expects this trend to continue, especially with the continued development of smaller combination chipsets that will allow the bundling of GPS technology into a wider variety of devices.

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6 *Id.*, 26 FCC Rcd at 10103 ¶¶ 84-85.

7 *See* Motorola Solutions, *Astro 25 Outdoor Location Solutions*, http://www.motorola.com/Business/US-EN/Business+Solutions/Product+Solutions/Location+Services/ASTRO+25+Location+Solutions/Outdoor%20Location_US-EN (last visited Sept. 9, 2011).

Today, public safety answering points ("PSAPs") receive ALI either along with or in parallel to an emergency call. With the adoption and implementation of the *E911 Location Accuracy Second Report and Order*, carriers will soon be required to provide "confidence and uncertainty" data with ALI on PSAP request.[8] Public safety responders should compare this information with data collected in the field to determine the actual accuracy of ALI that they receive. By working within existing public safety procedures and technologies, this approach is more accurate, expedient, and comprehensive than requiring a carrier or other third party to conduct systematic location accuracy tests, for both outdoor and indoor location accuracy.

[8] *See E911 Location Accuracy Second Report and Order*, 25 FCC Rcd at 18929 ¶ 54; Federal Communications Commission, *Wireless E911 Location Accuracy Requirements*, 76 Fed. Reg. 23713 (Apr. 28, 2011) (announcing implementation date of confidence and uncertainty data requirement of two years after January 18, 2011).

IV. CONCLUSION.

Bringing the benefits of a robust E911 system to as many Americans as possible is among the most important public policy goals at the Commission today. However, in pursuing this goal, the Commission should take care not to adopt new regulatory obligations before the technologies and markets are sufficiently developed to justify and support them. As discussed above, while the Commission has adopted many important improvements to the E911 system in its recent orders, many of the changes contemplated in the *Notice* are premature, at best. Rather than imposing new regulatory obligations, the Commission should support and monitor the ongoing technology and standards development processes, and it should be open to considering innovative and efficient alternatives.

Respectfully submitted,

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